

AMENDMENT

Please amend the application as indicated hereafter.

To the Claims:

Claim 1 (previously presented) A buffer device, for transmitting a plurality of messages between a source controller and a destination controller, comprising:

a plurality of message rows, for storing the messages that the source controller intends to transmit to the destination controller, each of the message rows at least comprising a write complete flag and a distribution complete flag;

a write control unit, coupled between the source controller and the plurality of message rows, used to sequentially output a plurality of free message row addresses according to the plurality of distribution complete flags, wherein when the buffer device still has a free message row, the source controller reads an address of a target message row that is currently free among said plurality of message rows, and the distribution complete flag of the target message row is set by the write control unit; and when the source controller completes writing a message of the target message row, the write complete flag of the target message row is set by the write control unit, and a read request for informing the destination controller to read the message of the target message row is issued; and when the buffer device has no free message row, said write control unit outputs a non-free message row signal; and

a read control unit, coupled between the destination controller and the plurality of message rows, to issue the read request to inform the destination controller to read the message of the target message row when the write complete flag of the target message

row is set, wherein once the destination controller completes reading the message of the target message row in response to the read request, the distribution complete flag set by the write control unit and the write complete flag of the target message row are both cleared by the read control unit, wherein the distribution complete flag has not been cleared by the write control unit before being cleared by the read control unit;

wherein the plurality of message rows are coupled between the write control unit and the read control unit.

Claim 2 (previously presented) The buffer device of claim 1, wherein the write control unit comprises:

a write pointer control unit, for storing a write address of the target message row, wherein after the source controller reads the write address of the target message row, said write pointer control unit sets the distribution complete flag of the target message row and progresses the write address, and when the source controller completes writing the message of the target message row, the write pointer control unit sets the write complete flag of the target message row;

a distribution complete flag multiplexer, coupled to the write pointer control unit and the distribution complete flags of the plurality of message rows, to output a not-distributed signal according to the distribution complete flag of the message row pointed to by the write address; and

a distribution address multiplexer, coupled to the distribution complete flag multiplexer and the write pointer control unit, to alternatively output one of the write address and the non-free message row signal according to the not-distributed signal.

Claim 3 (previously presented) The buffer device of claim 1, wherein the read control unit comprises:

a read pointer control unit, to store a read address of the buffer device, wherein when the destination controller completes reading the message of the message row pointed to by the read address, said read pointer control unit clears the distribution complete flag and the write complete flag of the message row pointed to by the read address, and progresses the read address;

a read buffer, coupled to the read pointer control unit and the plurality of message rows, to temporarily store the message of the message row pointed to by the read address; and

a read request multiplexer, coupled to the read pointer control unit and the write complete flags of the plurality of message rows, to output the read request according to the write complete flag of the message row pointed to by the read address.

Claim 4 (previously presented) The buffer device of claim 1, wherein each message row further comprises:

a command row, to store a command that the source controller intends to transmit to the destination controller; and

a data row, to store data that the source controller intends to transmit to the destination controller.

Claim 5 (previously presented) The buffer device of claim 4, wherein the size of the command row is four bytes.

Claim 6 (previously presented) The buffer device of claim 4, wherein the size of the data row is a multiple of four bytes.

Claim 7 (previously presented) The buffer device of claim 1, wherein the source controller is a central processing unit.

Claim 8 (previously presented) The buffer device of claim 1, wherein the destination controller is a central processing unit.

Claim 9 (previously presented) A method for transmitting a message of a source controller to a destination controller, through a message transmitting queue having a plurality of message rows, a write control unit and a read control unit, wherein the plurality of message rows are coupled between the write control unit and the read control unit, each of the plurality of message rows at least comprises a write complete flag and a distribution complete flag, the write control unit has a write pointer, and the read control unit has a read pointer; said method comprises the steps of:

setting the write pointer and the read pointer to point to a target message row among said message rows;

reading an address of the target message row pointed to by the write pointer by using the source controller, wherein after the source controller reads the address of the target message row, the distribution complete flag of the target message row is set by the write control unit, and the write pointer is progressed;

writing a message of the target message row by using the source controller, wherein the write complete flag of the target message row is set by the write control unit

once the source controller completes writing the message of the target message row;

once the write complete flag of the target message row is set, issuing a read request to inform the destination controller to read the message of the target message row;

once the destination controller completes reading the message of the target message row in response to the read request, clearing the distribution complete flag set by the write control unit and the write complete flag of the target message row by using the read control unit, wherein the distribution complete flag has not been cleared by the write control unit before being cleared by the read control unit; and

progressing the read pointer after the destination controller reads the message of the target message row.

Claim 10 (previously presented) The method of claim 9, wherein when the write pointer is progressed and points to a message row whose distribution complete flag is set, a non-free message row signal is asserted to inform the source controller.

Claim 11 (Original) The method of claim 9, wherein the source controller is a central processing unit.

Claim 12 (Original) The method of claim 9, wherein the destination controller is a central processing unit.

Claim 13 (Original) The method of claim 12, wherein the read request is an interrupt request of the central processing unit.

Claims 14-20 (canceled)

Claim 21 (previously presented) The buffer device of claim 1, wherein when the source controller receives the non-free message row signal, the source controller issues a request to ask for a free message row from the plurality of message rows after waiting for a predetermined period of time.

Claim 22 (previously presented) The buffer device of claim 1, wherein the read control unit issues the read request when the write complete flag of the target message row is set by the write control unit.

Claim 23 (previously presented) The method of claim 10, wherein when the source controller receives the non-free message row signal, the source controller issues a request to ask for a free message row from the plurality of message rows after waiting for a predetermined period of time.

Claim 24 (previously presented) The method of claim 10, wherein once the write complete flag of the target message row is set by the write control unit, issuing the read request to inform the destination controller.

Claim 25 (canceled)